APPLICATION OF NEURAL NETWORKS TO HYPERSPECTRAL UNMIXING

Jacob Barhen and Nikzad Toomarian

Jet Propulsion Laboratory"
California Institute of Technology
Pasadena, CA 91109

parameters of interest. The simplest case involves macroscopic mixtures (spectrally heterogeneous but spatially unresolved), where one typically assumes linear superposition of component spectra. In the more prevalent microscopic mixtures, a highly nonlinear relationship exists bet ween spectral radiances and parameters of interest,

From the above discussion, it becomes evident that the development of a technology that would be of value both to defense and commercial/civilian applications (particularly in areas such as atmospheric sciences, surface geology, agricultural and environmental monitoring, pollution control,,..) requires bridging the conceptual gap between these two computational paradigms. The purpose of this talk is therefore to attempt to suggest methodological guidelines for constructing such a unifying framework. Based on an indepth assessment of state-of-the-art technology from open literature publications, we are able to coalesce a number of strong arguments that support neural networks as the computational paradigm of choice for the generalized analysis (e.g., unmixing) of remotely sensed hyperspectral data.

Acknowledgements